

Introduction

The purpose of this course is to introduce the student to particle transport theory, and to computational methods associated with transport theory. Although the equations for neutron transport, charged-particle transport, infrared transport, and thermal radiation transport in the stellar regime appear to be quite different, they are actually quite similar from a computational viewpoint. There are basic computational approaches that require only minor modifications to accommodate all of these forms of transport. Furthermore, the most versatile method for solving these equations is the S_n method. Our approach in this course will be to teach the S_n method for neutron transport, and then discuss the modifications of the basic method for other applications. Methods other than the S_n method for solving the transport equation will be discussed, but only to make the student aware of them. The main effort for each student in this course will be to develop a 1-D slab-geometry monoenergetic transport code with diffusion-synthetic iterative convergence acceleration.

Administrative Details:

1. Sixty percent of a student's grade will come from two exams during the semester and a final exam.
2. All exams are take-home. Some of the problems will involve the use of computer codes written by each student.

3. Forty percent of a student's grade will come from homework. Provided that a student turns in the homework, credit is given whether or not it is correct. The homework represents practice for the tests, which tend to be very conceptual.
4. It is relatively easy to get a "B" in this course. All you have to do is work at it.